

## Abstract of the Disclosure

- 5 A noble metal nanometer-sized catalyst composition is described along with the method for preparation of the composition. The crystal face of the catalyst contains a preponderance of (111) type crystal phase exposure. The crystal phase exposure is controlled by sequestering the noble metal cation before deposition on a catalyst support. Controlled catalyst face exposition combined with the nanometer scale of the catalyst increases the catalyst selectivity and activity, particularly for hydrogenation and dehydrogenation reactions.